

DEPARTMENT OF CONSUMER & INDUSTRY SERVICES

DIRECTOR'S OFFICE

CONSTRUCTION SAFETY STANDARDS

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(as amended November 15, 1989) (as amended on July 8, 1993) **(as amended September 3, 1996)**

These rules take effect 15 days after filing with the Secretary of State

(By authority conferred on the director of the department of consumer and industry services by sections 19 and 21 of Act No. 154 of the Public Acts of 1974, as amended, and Executive Reorganization Order No. 1996-2, being §§408.1019, 408.1021, and 445.2001 of the Michigan Compiled Laws)

R 408.42101, R 408.42121, R 408.42122, R 408.42123, R 408.42145, R 408.42150, and R 408.42160 of the Michigan Administrative Code are effective as of the date of this amendment.

R 408.42131 is added to read as hereinafter set forth.

R 480.42140, R 408.42141, R 408.42142, R 408.42143, R 408.42144, R 408.42146, R 408.42147, R 408.42148, R 408.42151, R 408.42152, R 408.42153, and R 408.42158 are rescinded.

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PART 21. GUARDING OF WALKING AND WORKING AREAS

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GENERAL PROVISIONS

R 408.42101. Scope.

Rule 2101. This part pertains to the construction and use of guardrails, stairways, ramps, and runways for the protection of employees during construction operations. It also applies to all stairways that are used in the construction, alteration, repair, including painting and decorating, and demolition of workplaces and when stairways are required to be provided.

R 408.42121. Definitions; H to N.

Rule 2121. (1) "Handrail" means a lengthwise member which is supported by brackets and which is suspended from a wall or partition on a stairway or ramp to furnish a handhold.

(2) "Lower levels" means those areas to which an employee can fall from a stairway, including any of the following:

- (a) Ground levels.
- (b) Floors.
- (c) Roofs
- (d) Ramps.
- (e) Runways.
- (f) Excavations.
- (g) Pits.
- (h) Tanks.
- (i) Material.

(j) Water.

(k) Equipment.

(l) Similar surfaces.

It does not include the surface from which the employee falls.

(3) "Nosing" means that portion of a tread projecting beyond the face of the riser immediately below it.

R 408.42122. Definitions; P, R.

Rule 2122. (1) "Point of access" means all areas used by employees for work-related passage from one area or level to another, including all of the following:

- (a) Doorways.
- (b) Passageways.
- (c) Stairway openings.
- (d) Studded walls.
- (e) Other permanent or temporary openings used for work related passage from one area or level to another.

(2) "Ramp" means an inclined runway used to allow employees to move, or allow equipment to be moved, from one level to another.

(3) "Rise" means the vertical distance from the top of a tread to the top of the next higher tread.

(4) "Runway," sometimes called a walkway, means a passageway that is above floor or ground level, such as a footwalk between 2 structures.

R 408.42123. Definitions; S, W.

Rule 2123. (1) "Spiral stairway" means a series of steps attached to a vertical pole and progressing upward in a winding fashion within a cylindrical space.

(2) "Stair platform" means a landing that breaks a continuous run of stairs.

(3) "Stair railing" means a vertical barrier that is erected on an exposed side of a stairway to prevent employees from falling to lower levels. The top surface of a stair rail system may also be a handrail.

(4) "Tread depth" means the horizontal distance from the front to the back of a tread, excluding nosing, if any.

R 408.42127. Access to other elevations.

Rule 2127. (1) A means of access, such as a stairway, ladder, or ramp, shall be provided at all personnel points of access where there is a break in elevation of 19 inches (48cm) or more and a runway, sloped embankment, or personnel hoist is not provided.

(2) When a building or structure has only 1 point of access between levels, that point of access shall be kept clear to permit the free passage of employees. When work must be performed or equipment must be used such that the free passage of employees at that point of access is restricted, a second point of access shall be provided and used.

(3) When a building or structure has 2 or more points of access between levels, at least 1 point of access shall be kept clear to permit the free passage of employees.

(4) Employees shall not use any spiral stairways that will not be a permanent part of the structure on which construction work is being performed.

R 408.42128. Stairway protection systems.

Rule 2128. Employers shall provide and install all stairway fall protection systems required by this part and shall comply with all other pertinent requirements of this part before employees begin the work that necessitates the installation and use of stairways and their fall protection systems.

R 408.42129. Stairways; landings; installation; rise height and tread depth; metal pan landings and metal pan treads; guardrail systems required.

Rule 2129. (1) Stairways that will not be a permanent part of the structure on which construction work is being performed shall have landings that are not less than 30 inches (76cm) in the direction of travel and extend not less than 22 inches (56cm) in width at every 12 feet (3.7m) or less of vertical rise.

(2) Stairs shall be installed between 30 degrees and 50 degrees from horizontal.

(3) Riser height and tread depth shall be uniform within each flight of stairs, including any foundation structure used as one tread depth shall not be more than 1/4 of an inch (0.6cm) in any stairway system.

(4) Metal pan landings and metal pan treads, when used, shall be secured in place before filling with concrete or other material.

(5) Unprotected sides and edges of stairway landings shall be provided with guardrail systems.

R 408.42130. Training requirements.

Rule 2130. (1) An employer shall provide a training program for each employee who uses stairways, as necessary. The program shall enable each employee to recognize hazards related to stairways and shall train each employee in the procedures to be followed to minimize these hazards.

(2) An employer shall ensure that each employee has been trained by a competent person in the following areas, as applicable:

(a) The nature of fall hazards in the work area.

(b) The rules contained in this part.

(3) Retraining shall be provided for each employee as necessary so that the employee maintains the understanding and knowledge acquired through compliance with the provisions of this rule.

R 408.42131. Roof work.

Rule 2131. (1) An employer working on a high-pitched roof shall be provided with and use either roofing brackets and a working plank or a crawling board, regardless of the ground-to-eave height.

(2) An employer shall protect employees working on a dome-type roof as prescribed in Part 45. Fall Protection, being R 408.44501 et seq. of the Michigan Administrative Code.

(3) The portion of a roof where employees are working shall be kept free of ice, snow, or other slippery conditions.

R 408.42145. Hatchway and chute-floor openings.

Rule 2145. (1) A hatchway or chute-floor opening that is less than 39 inches above the floor shall be guarded by either of the following:

(a) A hinged cover and a fixed guardrail on not less than 2 sides. When the opening is not in use, the cover shall be closed or a removable guardrail shall guard the exposed side.

(b) A removable guardrail on 2 sides and fixed guardrail on the other 2 sides. The removable guardrail shall be kept in place when the opening is not in use.

(2) When dumping from mechanical equipment or a wheelbarrow, the exposed edge of the hatchway, chute opening, or open-sided floor shall be protected by a bumper. The bumper shall be not less than 6 inches nominal size and shall be secured to the floor.

R 408.42149. Stairways.

Rule 2149. (1) A stairway shall be equipped with a stair railing or handrail as follows:

(a) A stairway which is not more than 44 inches wide and which has enclosed sides shall have a handrail on the right descending side.

(b) A stairway which is not more than 44 inches wide and which has 1 open side shall have a stair railing on the open side.

(c) A stairway which is not more than 44 inches wide and which has 2 open sides shall have a stair railing on each side.

(d) A stairway that is more than 44 inches wide shall have 1 handrail on each enclosed side and 1 stair rail on each open side.

(e) A stairway that is 88 or more inches wide shall have 1 handrail on each enclosed side, 1 stair rail on each open side, and 1 intermediate stair rail located in the middle of the stairway.

(2) Where a door or gate opens directly on a stairway more than 6 feet in height and is used as a required means of egress, a stair landing shall be provided. The swing of the door shall not reduce the landing which leads to the stairway to less than 20 inches unless specified in another code.

(3) Debris and other loose material shall not be permitted on a stairway.

R 408.42150. Guardrail specifications for scaffolding and catch platforms.

Rule 2150. (1) A guardrail shall consist of a top rail, intermediate rail, and supporting posts. The top rail shall have a smooth surface and shall be located not less than 36, nor more than 42, inches above the floor, ramp, platform, or runway. The intermediate rail shall be located halfway between the top rail and the floor, ramp, platform, or runway. The top rail shall not overrun the terminal posts unless such a projection does not constitute a hazard.

(2) A top rail and its supporting posts shall be constructed of wood which is not less than 2- by 4- inch nominal size with a 1- by 6- inch or 2- by 4- inch nominal size intermediate rail. The construction and fastenings shall produce a guardrail capable of withstanding a 200-pound capability. A guardrail that is subject to additional loads shall be constructed of heavier stock and the supporting post shall be more closely spaced.

(3) Vertical supporting posts shall be placed not more than 8 feet apart.

(4) Banding steel shall not be used for guardrail construction.

(5) Welded resteel members shall not be used for guardrail construction.

R 408.42154. Runway and ramp specifications.

Rule 2154. (1) A ramp or runway that is used exclusively by employees as a means of access to or egress from a walking or working surface shall be in compliance with all of the following provisions:

- (a) Be capable of supporting not less than 2 times the maximum intended load.
 - (b) Consist of a minimum of two 2-inch by 10-inch nominal size planks placed side by side or other material of equal width that provides equivalent strength if guardrails are not required.
 - (c) Consist of a minimum of three 2-inch by 10-inch nominal size planks placed side by side or other material of equal width that provides equivalent strength if guardrails are required.
 - (d) Not be constructed steeper than the ratio of 1 foot of vertical rise to 2 feet of horizontal run.
 - (e) Have a slip-resistant surface or have cleats which are not more than 2 inches by 4 inches nominal size and which are uniformly spaced not more than 24 inches apart.
 - (f) Be constructed to avoid excessive deflection and springing action.
 - (g) Be secured at each end to prevent displacement.
 - (h) Not be used for the storage of materials or equipment.
 - (i) Be maintained free of debris, other loose materials, and slip or trip hazards.
- (2) A ramp or runway used by employees with wheelbarrows shall be in compliance with both of the following provisions:
- (a) Be constructed and used as prescribed in subrule (1)(a), (d), (e), (f), (g), (h), and (i) of this rule.
 - (b) Consist of three 2-inch by 10-inch nominal size planks placed side by side or other material of equal width that provides equivalent strength.
- (3) A ramp or runway used by concrete buggies, fork lift trucks, or other motorized material handling equipment shall be in compliance with all of the following provisions:
- (a) Be capable of supporting not less than 4 times the maximum intended load.
 - (b) Be not less than 5 feet wide.
 - (c) Be constructed and used as prescribed in subrule (1)(a), (d), (f), (g), (h), and (i) of this rule.
 - (4) A ramp or runway constructed of 2 or more planks placed side by side shall have the planks securely fastened together.

R 408.42155. Specifications for stair rail.

Rule 2155. (1) A stair railing shall consist of a stair rail, a vertical support, and an intermediate rail or its equivalent to prevent an employee from falling through the opening between the stair rail and the stairs. The stair rail shall parallel the slope of the stairway.

(2) A stair rail shall be smooth, made of 2- by 4-inch nominal-sized lumber, and constructed in a manner to withstand a side thrust of not less than 200 pounds. The height of a stair rail shall be as follows:

- (a) A stair rail that is installed after March 15, 1991, shall be not less than 36 inches (91.5cm) from the upper surface of the stair rail system to the surface of the tread and in line with the face of the riser at the forward edge of the tread.
- (b) A stair rail that is installed before March 15, 1991, shall be not less than 30 inches (76cm) nor more than 34 inches (86cm) from the upper surface of the stair rail system to the surface of the tread and in line with the face of the riser at the forward edge of the tread.
- (3) The vertical post shall be constructed of not less than 2- by 4-inch nominal-sized lumber and shall be spaced not more than 6 feet apart.
- (4) An intermediate rail or midrail shall be constructed of not less than 1- by 6-inch or 2- by 4-inch nominal-sized lumber and shall be installed midway between the stair rail and the treads.
- (5) Screens, mesh, intermediate vertical members, or equivalent intermediate structural members shall be provided between the top rail of the stair rail system and the stairway steps.
- (6) Screens or mesh, when used, shall extend from the top rail to the stairway step and along the entire opening between the top rail supports.
- (7) When intermediate vertical members, such as balusters, are used between posts, they shall be not more than 19 inches (48cm) apart.
- (8) Other structural members, when used, shall be installed such that there are no openings in the stair rail system that are more than 19 inches (48cm) wide.
- (9) A stair rail shall not have protruding nails or rough or sharp corners and shall not constitute a projection hazard.
- (10) Other material may be used if the stair railing meets the 200-pound side thrust requirement.
- (11) A stairway that has 4 or more risers or rises more than 30 inches (76cm), whichever is less, shall be equipped with at least 1 handrail and at least 1 stair rail system along each unprotected side or edge. When the top edge of a stair rail system also serves as a handrail, the provisions of R 408.42156(3) of these rules apply.
- (12) Winding and spiral stairways shall be equipped with a handrail that is sufficiently offset to prevent walking on those portions of the stairways where the tread width is less than 6 inches (15cm).

R 408.42156. Handrail specifications.

Rule 2156. (1) A handrail shall be of a configuration that provides a handhold when grasped to avoid a fall and shall follow the slope of the stairway.

(2) A handrail shall be vertically installed not more than 37, nor less than 30, inches above the front edge of the treads.

(3) When the top edge of a stair rail system also serves as a handrail, the height of the top edge shall be not more than 37 inches (94cm) nor less than 36 inches (91.5cm) from the upper surface of the stair rail system to the surface of the tread and in line with the face of the riser at the forward edge of the tread.

(4) A handrail shall be supported by brackets to a distance of not less than 1 1/2 inches from any object.

The assembly of handrail and brackets shall withstand a load of not less than 200 pounds applied in any direction.

(5) A handrail shall have a smooth surface along the top and sides and the ends shall not present a projection hazard.

(6) Handrails that will not be a permanent part of the structure being built shall have a minimum clearance of 3 inches (3cm) between the handrail and walls, stair rail systems, and other objects.

(7) The ends of stair rail systems and handrails shall be constructed so as not to constitute a projection hazard.

R 408.42157. Temporary stairways.

Rule 2157. (1) All wooden components that are necessary to construct and guard a temporary stairway shall be of construction-grade lumber.

(2) The minimum size of stringers shall be 2 by 8 inches unless notched. If notched, the stringers shall have a plate or equivalent means which provides the same strength that an uncut 2-inch by 8-inch stringer provides.

(3) The minimum width of a temporary stairway shall be 22 inches.

(4) Each tread shall rest on 2-inch by 4-inch cleats or be notched into the stringer, to provide a bearing surface for the full width of the tread.

(5) For a temporary stairway between 22 and 36 inches wide, a minimum of a 2-inch by 6-inch plank shall be used for a tread.

(6) For a temporary stairway between 36 and 54 inches wide, a minimum of a 2-inch by 8-inch plank shall be used for a tread.

(7) For a temporary stairway over 54 inches wide, a 2-inch by 10-inch plank shall be used for a tread.

(8) If the width of a temporary stairway is more than 88 inches, an additional notched stringer shall be provided at the middle of the stairway.

(9) The total vertical rise of a temporary stairway shall not be more than 12 feet, unless stair platforms are provided.

(10) The rise shall be not less than 6 inches nor more than 8 inches.

(11) The ratio of rise to tread width shall be uniform for all sets of stairs.

(12) Each tread shall be constructed and maintained of solid, 1-piece lumber and repairs shall be made with solid 1-piece lumber.

(13) The sides of a temporary stairway shall be guarded as required by the provisions of R 408.42155 and R 408.42156, except that a stairway used as access to material storage trailers is required to be guarded on only 1 side.

(14) If used during construction, permanent steel or other metal stairways and landings with hollow pan-type treads that are to be filled with concrete or other materials shall be filled to the level of the nosing with solid material. This requirement shall not apply during the period of actual construction of the stairways. Metal landings shall be secured in place before filling. Such temporary treads and landings shall be replaced when worn below the level of the top edge of the pan.

(15) A stairway shall be free of hazardous projections, such as nails, sharp top rails, and handrail projections.

(16) A stairway shall have a minimum vertical clearance of 7 feet from any overhead object, unless the overhead object is padded and caution signs or paint is used on the object, as prescribed in Part 22. Signals, Signs, Tags, and Barricades, being R 408.42201 et seq. of the Michigan Administrative Code.

(17) Except during stairway construction, foot traffic is prohibited on skeleton metal stairs where permanent treads or landings are to be installed at a later date, unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread or landing area.

(18) Treads for temporary service shall be made of wood or other solid material and shall be installed the full width and depth of the stair.

R 408.42159. Maintenance.

Rule 2159. (1) A floor, platform, stair tread, or landing shall be maintained free of tripping or slipping hazards.

(2) Material used to repair floors, platforms, stair treads, or landings shall meet the design strength of the original component.

(3) A floor, platform, stair, runway, or ramp shall be free of hazardous projections.

R 408.42160. Catch platform specifications.

Rule 2160. If a catch platform is installed as a means of fall protection for an employee or employees working on a roof, the catch platform shall be in compliance with all of the following provisions:

- (a) Consist of a minimum of three 2- inch by 10- inch nominal size planks placed side by side or other material of equal width that provides equal strength.
- (b) Be installed a maximum of 18 inches beneath the eave line of the roof.
- (c) Have a guardrail that meets the requirements of R 408.42150 installed on the outer exposed edge and each end. An additional intermediate rail, solid material, or a screen shall be installed between the catch platform and the midrail.